



## CONTENTS

### PREFATORY CHAPTER

- The Making of a Comparative Physiologist, *C. Ladd Prosser* 1

### RENAL AND ELECTROLYTE PHYSIOLOGY

- Introduction, *Carl W. Gottschalk, Section Editor* 7  
ATP and the Regulation of Renal Cell Function, *Stephen P. Soltoff* 9  
Renal Metabolism During Normoxia, Hypoxia, and Ischemic Injury, *Dean P. Jones* 33  
Inositol Phospholipid Metabolism in the Kidney, *D. A. Troyer, D. W. Schwertz, J. I. Kreisberg, and M. A. Venkatachalam* 51

### GASTROINTESTINAL PHYSIOLOGY

- Introduction, *John G. Forte, Section Editor* 73  
Identification of Cellular Activation Mechanisms Associated with Salivary Secretion, *J. W. Putney, Jr.* 75  
Characterization of Receptors Regulating Secretory Function in the Fundic Mucosa, *Martin J. Sanders and Andrew H. Soll* 89  
Receptors and Cell Activation Associated with Pancreatic Enzyme Secretion, *Jerry D. Gardner and Robert T. Jensen* 103  
Functional Activities of Hepatic Lipoprotein Receptors, *Richard J. Havel* 119  
 $\text{Ca}^{2+}$  and Cyclic AMP in Regulation of Intestinal Na, K, and Cl Transport, *Mark Donowitz and Michael J. Welsh* 135

### CELL AND MEMBRANE PHYSIOLOGY

- Introduction, *Joseph F. Hoffman, Section Editor* 151  
Regulation of Transepithelial  $\text{H}^+$  Transport by Exocytosis and Endocytosis, *George J. Schwartz and Qais Al-Awqati* 153  
Osmotic Swelling of Vesicles, *Alan Finkelstein, Joshua Zimmerberg, and Fredric S. Cohen* 163

(continued) v

vi CONTENTS (continued)

The Role of Osmotic Forces in Exocytosis from Adrenal Chromaffin Cells, <i>Ronald W. Holz</i>	175
Electrical Regulation of Sperm-Egg Fusion, <i>Laurinda A. Jaffe and Nicholas L. Cross</i>	191
Mimicry and Mechanism in Phospholipid Models of Membrane Fusion, <i>R. P. Rand and V. A. Parsegian</i>	201
Role of Membrane Fusion in Hormonal Regulation of Epithelial Transport, <i>James B. Wade</i>	213
Regulation of Membrane Fusion in Secretory Exocytosis, <i>Robert C. De Lisle and John A. Williams</i>	225
<b>CARDIOVASCULAR PHYSIOLOGY</b>	
Introduction, <i>Harvey V. Sparks, Jr., Section Editor</i>	239
Specialized Properties and Solute Transport in Brain Capillaries, <i>A. Lorris Betz and Gary W. Goldstein</i>	241
Prostaglandin Biosynthesis and Its Compartmentation in Vascular Smooth Muscle and Endothelial Cells, <i>William L. Smith</i>	251
Metabolic Activity of Pulmonary Endothelium, <i>Una S. Ryan</i>	263
Functions of the Endothelial Cell Surface, <i>Maya Simionescu and Nicolae Simionescu</i>	279
Endothelial Cell Influences on Vascular Smooth Muscle Phenotype, <i>Julie H. Campbell and Gordon R. Campbell</i>	295
Modulation of Vascular Smooth Muscle Contraction by the Endothelium, <i>Paul M. Vanhoutte, Gabor M. Rubanyi, Virginia M. Miller, and Donald S. Houston</i>	307
Indicator Dilution Estimation of Capillary Endothelial Transport, <i>James B. Bassingthwaighe and Harvey V. Sparks, Jr.</i>	321
Endothelial Cell Metabolism of Biogenic Amines, <i>David Shepro and Bernadette Dunham</i>	335
<b>SPECIAL TOPIC: ACID-BASE REGULATION</b>	
Introduction, <i>Walter F. Boron, Section Editor</i>	347
Intracellular pH Regulation by Vertebrate Muscle, <i>C. Claire Aickin</i>	349
Effects of Growth Factors on Intracellular pH Regulation, <i>Wouter H. Moolenaar</i>	363
Intracellular pH Regulation in Epithelial Cells, <i>Walter F. Boron</i>	377
Mechanisms and Consequences of pH-Mediated Cell Regulation, <i>William B. Busa</i>	389

ATP-Driven H <sup>+</sup> Pumping into Intracellular Organelles, <i>Gary Rudnick</i>	403
SPECIAL TOPIC: CELL BIOLOGICAL APPROACHES TO BRAIN FUNCTION	
Introduction, <i>Paul Greengard, Section Editor</i>	415
Cell Adhesion Molecules in Neural Histogenesis, <i>Gerald M. Edelman</i>	417
Genes Encoding Mammalian Neuroendocrine Peptides, <i>Kelly E. Mayo, Ronald M. Evans, and Geoffrey M. Rosenfeld</i>	431
Neural Grafting in the Aged Rat Brain, <i>Fred H. Gage and Anders Björklund</i>	447
Neuronal Receptors, <i>Solomon H. Snyder</i>	461
ENDOCRINOLOGY AND METABOLISM	
Introduction, <i>Jack L. Kostyo, Section Editor</i>	473
Mediation by Corticotropin Releasing Factor (CRF) of Adenohypophysial Hormone Secretion, <i>Catherine L. Rivier and Paul M. Plotsky</i>	475
Mechanism of Action of Gonadotropin Releasing Hormone, <i>P. Michael Conn, Daphne Staley, Cynthia Harris, William V. Andrews, William C. Gorospe, Craig A. McArdle, William R. Huckle, and James Hansen</i>	495
Mechanism of Thyrotropin Releasing Hormone Stimulation of Pituitary Hormone Secretion, <i>Marvin C. Gershengorn</i>	515
Endogenous Opioid Peptides and Hypothalamo-Pituitary Function, <i>Trevor A. Howlett and Lesley H. Rees</i>	527
Substance P and Neurotensin, <i>Neil Aronin, Rafael Coslovsky, and Susan E. Leeman</i>	537
Somatostatin Mediation of Adenohypophysial Secretion, <i>Yogesh C. Patel and Coimbatore B. Srikant</i>	551
Growth Hormone Releasing Hormone, <i>Marie C. Gelato and George R. Merriam</i>	569
COMPARATIVE PHYSIOLOGY	
Introduction, <i>James E. Heath, Section Editor</i>	593
Integration and Central Processing in Temperature Regulation, <i>Christopher J. Gordon and James E. Heath</i>	595
Neurotransmitters in Temperature Control, <i>J. M. Lipton and Wesley G. Clark</i>	613

viii CONTENTS (continued)

Cutaneous Temperature Receptors, <i>David C. Spray</i>	625
Temperature Receptors in the Central Nervous System, <i>Jack A. Boulant and Jay B. Dean</i>	639

RESPIRATORY PHYSIOLOGY

Introduction, <i>Robert E. Forster, II, Section Editor</i>	655
Oxy-Radicals and Related Species, <i>William A. Pryor</i>	657
Oxidant Production and Bactericidal Activity in Phagocytes, <i>Henry Jay Forman and Michael J. Thomas</i>	669
The Response of the Lung to Foreign Compounds That Produce Free Radicals, <i>L. L. Smith</i>	681
Antioxidant Defenses in the Lung, <i>Irwin Fridovich and Bruce Freeman</i>	693
The Relation of Free Radical Production to Hyperoxia, <i>Dana Jamieson, Britton Chance, Enrique Cadenas, and Alberto Boveris</i>	703
Morphologic Changes in Pulmonary Oxygen Toxicity, <i>James D. Crapo</i>	721

INDEXES

Subject Index	733
Cumulative Index of Contributing Authors, Volumes 44-48	759
Cumulative Index of Chapter Titles, Volumes 44-48	762

